

Predictive Accuracy of Multiple Predictors for Censored Event Times

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In cohort studies, the subject's time to the occurrence of a certain event (e.g., cancer or death), which is possibly censored, is often collected, along with information on some clinical and genetic factors. An important objective of these studies is to determine which set of factors is most predictive of the subject's event time and should be used to guide the selection of targeted therapy in clinical practice. To address this question, the predictive accuracy of multiple predictors for the event time must be quantified. In this talk, we present a clinically meaningful measure to evaluate the predictive accuracy of multiple predictors for the potentially censored event time. We show that the new measure is maximized at the true subset of predictors. We develop nonparametric estimators for the new measure under flexible censoring mechanisms. The proposed estimators are shown to be consistent and asymptotically normal. Simple Monte Carlo methods are developed to approximate the asymptotic distributions. Simulation studies show that the proposed methods perform well in practical situations. Empirical data from a Mayo primary biliary cirrhosis study and a UNC breast cancer study are provided for illustration.

This is joint work with Drs. Danyu Lin and Donglin Zeng.